

IN THE UNITED STATES DISTRICT COURT FOR THE
NORTHERN DISTRICT OF OKLAHOMA

W. A. DREW EDMONDSON, in his)
capacity as ATTORNEY GENERAL)
OF THE STATE OF OKLAHOMA and)
OKLAHOMA SECRETARY OF THE)
ENVIRONMENT C. MILES TOLBERT,))
in his capacity as the)
TRUSTEE FOR NATURAL RESOURCES)
FOR THE STATE OF OKLAHOMA,)

Plaintiff,)

vs.)

4:05-CV-00329-TCK-SAJ

TYSON FOODS, INC., et al,)

Defendants.)

VOLUME I OF THE VIDEOTAPED
DEPOSITION OF BERNARD ENGEL, PhD, produced as a
witness on behalf of the Defendants in the above
styled and numbered cause, taken on the 8th day of
January, 2009, in the City of Tulsa, County of
Tulsa, State of Oklahoma, before me, Lisa A.
Steinmeyer, a Certified Shorthand Reporter, duly
certified under and by virtue of the laws of the
State of Oklahoma.

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EXHIBIT

113

1 having first been duly sworn to testify the truth,
2 the whole truth and nothing but the truth, testified
3 as follows:

4 DIRECT EXAMINATION

5 BY MR. GEORGE:

09:04AM

6 Q Mr. Engel, my name is Robert George. You and
7 I met briefly before the deposition. Could you
8 state your full name for the Record, please?

9 A Certainly. Bernard Allen Engel but you can
10 call me Bernie. Most people do.

09:04AM

11 MR. PAGE: Mr. George, before we begin, can
12 I just get your agreement on the Record that the
13 objections will be reserved except as to form?

14 MR. GEORGE: Certainly.

15 MR. PAGE: Thank you.

09:04AM

16 Q Mr. Engel, who is your current employer?

17 A I'm employed at Purdue University, and in this
18 particular case by the State of Oklahoma I guess
19 indirectly.

20 Q You do understand you are appearing for this
21 deposition as a result of your engagement with the
22 State of Oklahoma as a consultant or an expert
23 witness?

09:04AM

24 A Correct.

25 Q Have you ever given a deposition before?

09:04AM

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1 to make it as accurate as possible?

2 MR. GARREN: Object to form.

3 A Yes.

4 Q Turn to Page 2 of your May 22nd, 2008 report,

5 and I guess Arabic number 2 as opposed to Roman 09:38AM

6 numeral 2. Do you see that you've summarized some

7 of your opinions on Page 2 under the heading

8 hydrologic water quality modeling of the Illinois

9 River watershed?

10 A Yes. 09:38AM

11 Q Could you read for the Record Opinion 8?

12 A Poultry waste land application in the IRW is a

13 substantial contributor, paren, 45 percent between

14 1998 and 2006, and 59 percent between 2003 and 2006,

15 closed paren, to P loads to Lake Tenkiller 09:39AM

16 representing the largest P source. WWTP P loads are

17 the second largest contributors to P loads to Lake

18 Tenkiller. Poultry plant discharges to WWTP

19 represent a significant portion of WWTP P loads.

20 Q Dr. Engel, do you agree that's a quantitative 09:39AM

21 opinion?

22 A Yes.

23 Q Okay, and, Dr. Engel, is that quantitative

24 opinion expressed in your May 2008 report the

25 product of water modeling work that you've done in 09:39AM

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1 this case?

2 A It is.

3 Q You see the second opinion on the same page?

4 A The one numbered two?

5 Q Actually, I apologize. I meant the first 09:40AM
6 opinion, the one numbered one.

7 A Yes.

8 Q Could you read that for the Record, please?

9 A The hydrologic water quality model was able to
10 accurately model the P loads to IRW rivers and 09:40AM
11 streams and Lake Tenkiller.

12 Q All right, and are you referring in that
13 opinion to the models that you used to derive the
14 quantitative opinions that we just identified in No.

15 8? 09:40AM

16 A Yes.

17 Q Okay, and do I understand from Opinion 1 that
18 you just read, Dr. Engel, that you believed in May
19 of 2008 that the modeling results that you were
20 looking at in drafting this report were accurate? 09:40AM

21 A Yes.

22 Q When you signed this report in May of 2008, as
23 a general matter, Dr. Engel, did you think the
24 analysis that you provided, including the various
25 figures and tables and charts, were accurate and 09:41AM

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1 contribution percentage-wise, if you want to think
2 of it that way, attributable to poultry decreases
3 from 66 percent to the 59 percent we just computed.

4 Q Okay. So between your May report and your
5 September report, the average annual percentage of 11:28AM
6 the poultry contribution to the load to Lake
7 Tenkiller has declined; is that right?

8 MR. GARREN: Object to form.

9 A I'm not sure I'm answering the right question
10 here. So the average annual -- so, yes, the average 11:28AM
11 annual poultry contribution percentage has gone from
12 66 to 59 percent, so it's declined.

13 Q Okay. Why did you not change then, Dr. Engel,
14 in your September 2008 errata report the opinion
15 that you had offered in your prior report as Opinion 11:28AM
16 8 on Page 2, that poultry litter is a substantial
17 contributor between 45 percent from the time period
18 of '98 to 2006 or 59 percent between 2003 and 2006?

19 A So Opinion 8 in the May report is based on a
20 set of data that was correct in the May report. 11:29AM

21 Q Well, I thought you told me earlier that
22 Opinion 8 was based upon the output of your model.

23 A Opinion 8 was based on the output of the
24 model.

25 Q Okay, and you wrote the September report based 11:29AM

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1 upon the wrong output of the model; is that right?

2 A Realize that the -- could you repeat that
3 question again, sir? I'm sorry.

4 Q You wrote your May report that contains this
5 Opinion No. 8 based upon an incorrect run or the 11:30AM
6 inappropriate output from the model; is that right?

7 A Some of the -- just a portion of the report is
8 based on an incorrect output of the model.

9 Q Okay. Let me ask it as basic as I can. How
10 is it, Dr. Engel, that your opinion about the annual 11:30AM
11 contribution of poultry litter to the increased P
12 load each year has changed but your opinion about
13 the relative contribution of poultry litter to the
14 phosphorus loads for the aggregated periods has not
15 changed? 11:30AM

16 A Those are different model runs and different
17 model outputs.

18 Q Well, do you have an opinion today as to what
19 is the relative contribution of poultry litter
20 between '98 and 2006? 11:30AM

21 A It was the same as what was reported in the
22 May report.

23 Q 45 percent?

24 A Well, let's look at it. Yeah, at Opinion 8.
25 Opinion 8 indicates between 1998 and 2006 poultry 11:31AM

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1 better datasets that might be available that he
2 might access and take advantage of, and that's been
3 the -- kind of the extent of the effort.

4 Q Do you feel like you've answered my question?

5 A Repeat the question I guess. 01:50PM

6 Q Sure. Can you help me understand why the
7 lawyers involved in this case would be paying you to
8 work with Dr. Storm on a project for ODEQ?

9 MR. GARREN: Object to form.

10 Q Do you know? 01:50PM

11 A Well, I can make assumptions. If you want me
12 to speculate, I can speculate.

13 Q If you have a theory, I'd like to hear it.

14 A Well, I think the goal here is to, you know,
15 best model the IRW as one can, given the resources 01:50PM
16 and data that are available, and best understand the
17 potential contributors to the phosphorus problem,
18 and so if, you know, it's possible to improve the
19 modeling effort in order to predict the phosphorus
20 loads to the lake, then, you know, that would seem 01:51PM
21 to be an appropriate goal.

22 Q But haven't you already figured that out, Dr.
23 Engel, with your work using GLEAMS and the routing
24 model?

25 A I guess I would point out that, you know, and 01:51PM

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1 you've pointed this out as well, that there have
2 been multiple modeling studies, among other kinds of
3 studies, of the IRW and, you know, I think virtually
4 every one of those studies has reached the same
5 conclusions regarding phosphorus contributions, you 01:51PM
6 know, poultry is a significant contributor to the
7 phosphorus concentrations, to the gauging stations
8 and to Lake Tenkiller and, you know, and, therefore,
9 you know, if we can have multiple lines of evidence
10 that are all saying the same thing, and for all 01:52PM
11 intents and purposes these are, poultry is a
12 significant contributor of phosphorus, you know,
13 that just again provides evidence regarding, you
14 know, the appropriate kinds of actions that may be
15 needed to address the phosphorus issue. 01:52PM

16 Q I think I've already asked this question but
17 at the risk of being repetitive, I'll do it again.
18 Can you point me to a single other study, Dr. Engel,
19 where a scientist other than you looking at the
20 Illinois River watershed has come to the conclusion 01:52PM
21 that poultry litter accounts for either 45 percent
22 or 56 percent of the annual load of phosphorus --

23 MR. GARREN: Object to form.

24 Q -- to Lake Tenkiller?

25 MR. GARREN: I'm sorry. Object to the 01:52PM

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1 something that was more than 500,000 or approaching
2 500,000 and, in fact, if I used data that the
3 defendants supplied based on poultry production from
4 2001 to 2006, the amount of waste generated would
5 have ranged from 421,000 to 482,000 tons a year. So
6 the selection of 354,000 is obviously on the low end
7 and obviously favors the defendants.

05:39PM

8 Q How does that favor the defendants?

9 A Well, if -- it's fairly straightforward. So
10 if more poultry waste is being generated and, you
11 know, if we believe your number as to the amount
12 that's been exported from the watershed, the
13 remainder is being land applied, and as it's land
14 applied, you know, all the literature indicates some
15 of that is going to run off, and it's going to run
16 off proportional to the amount that's been applied,
17 and so if we picked a bigger number, applied more of
18 that in the landscape in the IRW, we would have
19 attributed even more phosphorus to poultry.

05:39PM

05:39PM

20 Q Okay. So, Dr. Engel, if you had used, let's
21 say, a million tons per year of poultry litter being
22 applied to the watershed, as your input value in
23 your model, you would expect to see a larger
24 percentage of the load at Lake Tenkiller being
25 allocated through your modeling exercise to the

05:40PM

05:40PM

1 poultry litter application; is that right?

2 A No, and let me tell you why.

3 Q Why not?

4 A So because the model was calibrated and one of

5 the values that was adjusted was the amount of waste 05:40PM

6 that was land applied. So, you know, if we had

7 been -- you know, if we had chosen not to calibrate

8 that parameter, then the answer would have been we

9 could certainly have attributed substantially more

10 to poultry if we had not been willing to calibrate 05:41PM

11 that parameter. So from that standpoint, you know,

12 this assumption -- you can think about this as an

13 assumption in the modeling. You know, this

14 assumption of the modeling benefitted your client a

15 great deal. You know, if we had not been willing to 05:41PM

16 make that adjustment, we could certainly have argued

17 you don't need to make that adjustment because we

18 know this amount of poultry waste has been generated

19 and we know that it's being land applied and we know

20 it's running off, everything says it does, you know, 05:41PM

21 we could have -- the model could have predicted

22 substantially more being attributed to poultry.

23 Q Okay. Just so I'm clear, Dr. Engel, because I

24 want to make sure I understand this, based upon the

25 way you chose to calibrate your model, your modeling 05:41PM

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